PATENT
Attorney Docket No. 211467-00211 (12-1100)

IN THE U.S. PATENT AND TRADEMARK OFFICE

Application No.:	09/833,372
Filing Date:	April 12, 2001
Inventor(s):	Wojtowicz
Group Art Unit:	2815
Examiner Name:	Baumeister, Bradley W.
Customer No.:	27160

Title: GaN HBT Superlattice Structure

Confirmation No.: 3137

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF

Sir:

In response to the Notification of Non-Compliant Appeal Brief mailed on April 11, 2007 and the Order Returning Undocketed Appeal to Examiner, mailed March 26, 2007, please find a revised version of Summary of the Claimed Subject Matter pursuant to MPEP § 1215.04 and § 702. It is respectfully submitted that the revised Summary should overcome the objection in the Notification.

Because the fee for filing the Appeal Brief was deducted from Deposit Account No. 50-1214 on July 13, 2005, it is believed no further fees are required; however, the Commissioner is authorized to charge any additional required fees (or credit overpayments) to Deposit Account No. 1214.

Summary Of Claimed Subject Matter

The present invention relates to a heterojunction bipolar transistor (HBT) 20 as illustrated in Fig. 1 and described in paragraphs [0013]-[0016] on pages 3 and 4 of the specification, having a relatively higher efficiency and higher frequency operation without the fabrication complexities of known HBTs. The subject matter of all of the claims on appeal is illustrated in Fig.1 and described in paragraphs [0013]-[0016] on pages 3 and 4 of the specification. None of the claims on appeal are in means plus function format. With reference to Fig. 1, the HBT 20 includes a substrate 22, a n^+ gallium nitride (GaN) subcollector 24 formed on top of the substrate 22. An n-GaN collector layer 26 is formed on top of the subcollector layer 24. In accordance with an important aspect of the invention, a base layer 28 is formed with non-constant band gap energy with a relatively low value at the collector base interface 30 and a higher value at the emitter base interface 32 in order to create an electrostatic field in the base to increase the carrier velocity and decrease the transit time of the device. The base layer 28 is formed from a superlattice consisting of alternating layers of AlGaN/GaN. An emitter layer 34 is formed on top of the base layer 28. The emitter layer 34 is formed from AlGaN. A collector contact 36 is formed on top of the subcollector layer 34 while a base contact 38 is formed on top of the base layer 28. An emitter contact 40 is formed on top of the emitter layer 34. The configuration of the device increases the injected electron transit time and at the same time increases the p-type carrier concentration to improve the operation efficiency of the device.

Claim 1 is representative of the independent claims. Below is a table which identifies the reference number and location in the specification of all elements in independent claim 1. Independent claim 1 is a product claim. The other independent product claims, namely 3 and 5 have essentially the same elements as claim 1 with some elements having different scope. Specifically, claims 3 and 5 differ from claim 1 primarily with respect to the scope of the superlattice base layer.

Claim 1	Reference No.	Page No.	Paragraph No.	Line Nos.	Fig. No.
. A heterojunction bipolar transistor (HBT) comprising:	20				Fig. 1
a substrate;	22	3	[0013]	Line 3	Fig. 1
an n+ doped GaN subcollector layer;	24	3	[0013]	Line 4 to Page 4- Line 3	Fig. 1
an n- doped GaN collector layer;	26	4	[0013]	Lines 3-4	Fig. 1
p+ doped base layer formed on top of said collector layer defining a base collector interface formed from alternating layers of A1GaN/GaN forming a superlattice;	28	4	[0014]	Lines 1-18	Fig. 1 Fig. 2
an n+ doped A1GaN emitter layer formed on top of said base layer defining an emitter base interface;	34	4	[0015]	Lines 1-3	Fig. 1
a base contact formed on said base layer;	35	4	[0016]	Lines 1-4	Fig. 1
a collector contact formed on said subcollector; and	36	4	[0016]	Lines 1-4	Fig. 1

an emitter contact formed on said emitter.	40	4	[0016]		

Dependent claim 4 relates to the grading of the Al concentration in the AlGaN superlattice base layer. Paragraph [0014] on page 4 of the specification, lines 10-15 and further illustrated in Fig. 2.

The process claims 8-11 are similar to the product claims 1-5 and have the same references as in the table above. Of the process claims , claims 8, 9 and 11 are independent. The dependent process claim 10 is similar to the dependent claim 4.

Respectfully submitted,

KATTEN MUCHIN ROSENMAN LLP

By: John S Paniaguas

John S. Paniaguas
Registration No. 31,051
Attorney for Applicant(s)

KATTEN MUCHIN ROSENMAN LLP.
1025 Thomas Jefferson Street N.W.
East Lobby: Suite 700
Washington, D.C. 20007-5201
(312) 902-5200 (Tel)
(312) 902-1061 (Fax)